



Recent developments in the wind energy sector in Poland



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ABSTRACT

The article describes and analyzes developments in the wind energy sector in Poland in 2012–2013 in a broader perspective of the main features of the energy sector in Poland. It encompasses the building of new wind farms, changes of ownership in the sector, prospects for offshore wind farms and support scheme developments. The article points out the current biggest barriers to further development of the wind energy sector and its future trends.

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1. Introduction

Wind energy is a technology for the production of renewable energy resources with the largest resources and the largest market potential. It is an attractive but still insufficiently used area of economic activity. According to the “Poland’s National Renewable Energy Action Plan” (NREAP) [1], the development of renewable

energy in Poland is based on the principle of rational use of existing energy resources. It is one of the objectives of climate and energy package, whose essential element is the Directive 2009/28/EC [2]. The Directive prescribes that each Member State shall ensure that the share of energy from renewable sources in gross final energy consumption in 2020 will reach at least its national overall target for the share of energy from renewable sources. The goal for Poland is set at 15%. Despite the difficult and unstable legal environment, wind energy in Poland is the fastest growing type of renewable energy sources [3]. In 2010 and 2011 the wind energy development in Poland also outperformed the NREAP’s forecasts.

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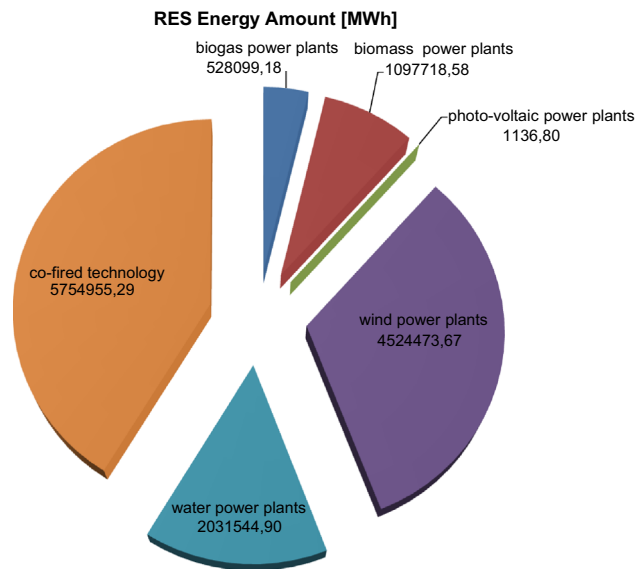


Fig. 1. RES energy produced in Poland in 2012 by types of sources.
Source: own compilation based on data from the Energy Regulatory Office 2013.

In 2012 gross electricity production reached around 160 TWh. Due to significant reserves of coal and lignite in Poland, the vast majority of production derived from conventional thermal sources. Most of the electricity was generated in thermal power plants including coal and lignite. However, comparing to the previous year, a significant increase in electricity production from renewable sources (mainly wind) is noticeable (see Fig. 1). The amount of energy produced from renewable sources in 2012 reached 2.52% of the total electricity production [4] and amounted to 13,937,928.422 MWh. This result (as of May 30, 2013) is confirmed by the number of certificates of origin issued by the President of the ERO pursuant to the Act – Energy Law [5].

The wind energy sector has a significant share of this fast-paced development of renewable energy sources in Poland. In recent years some significant developments, mainly related to the legal conditions, have occurred on the market. They may be signs of future trends and can significantly influence the situation on the wind energy market in Poland. These include in particular: recently initiated changes in the ownership structure of the wind energy market, changes in maritime law abolishing formal barriers to offshore projects, and the last events and trends on the green certificate market. Therefore, an interesting question arises: how will these transformations affect the development of the wind energy sector in Poland? The purpose of this paper is to analyze these recent transformations and new aspects and depict them in a broader context of the specific characteristics of the wind energy market in Poland. Moreover, recently completed developments of the market will be indicated and the significance of these changes for the development of wind energy in Poland will be determined. The period taken into consideration started at the beginning of 2012, and some noticeable amounts of facts and data come from the last three months.

2. The growth of investments in wind energy

According to research on technical potential, Poland has favorable conditions for the development of wind energy [7]. The most attractive areas include the Baltic Sea coast and coastal belt, the middle and northern part of Wielkopolskie and Mazowieckie Voivodships and southern mountainous regions [6]. Most of the biggest wind farms are situated in these regions. It should be

mentioned that 32% of the country belongs to the Natura 2000 protected areas which are concentrated in the regions with high wind potential. Although wind power locations are not excluded in those areas, they require additional environmental impact evaluations that can result in refusals or delays. It creates an important barrier to the installation of wind farms in these areas.

According to the EU's goals and obligations with regard to the environmental protection for an EU member since 2004, Poland's 15% of energy shall come from renewable energy sources by 2020. That results in great demand for investments in wind energy, which is the fastest growing type of renewable energy sources. In 2012, the level of new wind farms installed capacity has increased by about 880 MW, compared to 2011 (as of 30 May 2013 under licenses granted by the President of ERO) (see Fig. 2). The growth in wind power plants capacity was the largest of all renewable energy sources [4]. As a result, in 2012, Poland (with 8% of all new wind power capacity) was among the European leaders in wind energy installations (following Germany – 21%, UK – 16%, Italy – 11%, Romania – 8%). However, in terms of global installed capacity the leaders are Germany (30% of total wind power capacity in the European Union), Spain (22%), the UK (8%), Italy (8%) and France (7%) [8].

It follows that despite the existing barriers and limitations the pace of the development of the wind energy sector in Poland has accelerated in recent years. Although wind energy in Poland is still at an early stage of development, its potential is noticeable. In 2012 Poland was ranked the 10th most suitable location for wind power projects in the world by Ernst & Young ranking of wind energy potential [9]. Moreover, Poland is indicated as a country having the most mature wind market in the central and eastern European region [10].

The analysis of the wind farms developments finished last year shows that the investments in new wind farms can be divided into two groups according to the source of funding. The first category is a strictly commercial investment, like Rymanów wind farm, Podkarpackie Voivodship which was open in June 2013. The wind farm has a capacity of 26 MW, consists of 13 turbines and can produce 61 GWh of energy per year. The construction of this farm started in November 2011 and lasted until April 2013. The farm belongs to IKEA Retail Ltd. which owns two other farms in Poland located near the town of Bukowsko and Łęki and have a total capacity of 28 MW (14 turbines). All three wind farms have a total power of 54 MW and can generate power at the level of 135 GWh per year [11].

The second category of investments are the wind farms build with financial support from the EU. The example of such a wind farm is the farm in Golice (Lubuskie Voivodship) which consists of 19 wind turbines and has a total power of 38 MW and its expected generation of electricity is more than 80 GWh per year. In July 2013, the farm received 40 million PLN of financial support from

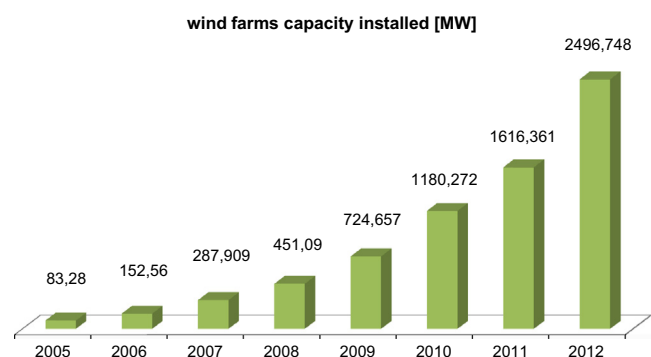


Fig. 2. Installed wind power capacity in Poland, years 2005–2012.
Source: own compilation based on data from the Energy Regulatory Office 2013.

the Operational Programme Infrastructure and Environment. The total cost of the farm and accompanying infrastructure was 56 million EURO (223 million PLN). Currently there are 5 more projects regarding wind farms under evaluation [12].

3. Ownership changes

3.1. Description of the undertakings involved

Apart from constructing new wind farms, undertakings have increased their wind power capacity by buying the existing wind farms. The recent ownership changes in the wind energy market involved ownership changes of wind farms and connected companies, and took place in June–July this year. There were four undertakings involved, two of them played an active role (PGE Ltd. and Energa Hydro Ltd.), and two passive (Iberdrola Renewables and Dong Energy).

PGE Ltd. acts as a management company (parent) of PGE Group consisting of about 50 subsidiaries [13]. PGE Capital Group is the largest energy sector company in Poland both in terms of revenue and profit generated [14]. In 2012, the total amount of installed capacity of PGE Group was 12.9 GW, and the amount of produced electricity was 57.05 TWh. PGE Group has its own networks, with a total length of 277.2 thousand miles in 2012 [13].

Energa Hydro Ltd. is a part of Energa holding company which is engaged in the manufacture, marketing and distribution of electricity and heat. It produces more than 4 TWh of electricity in 54 manufacturing facilities. Energa Group's installed capacity is about 1150 MW. Energa provides electricity for about 16% market share of total electricity sales. It is the operator of the electricity distribution system in the 25% of Poland's area. It operates more than 192 thousand miles of power lines which send a total of about 20 TWh of electricity per year. Energa is the country's largest green energy retailer, green energy production takes place in the network's own 46 hydroelectric plants and biomass burning facilities [15].

DONG Energy Company has been conducting its business activity in Poland since the construction of the first Polish wind farm in Zagórze. So far the company has built four farms: Zagórze, Karcino, Karnice and Jagniątkowo Lake Ostrowo. The wind farm in Karcino has a total capacity of 51 MW (17 wind turbines). The total capacity of the wind farm in Karnice is 30 MW (13 wind turbines). The wind farm in Jagniątkowo consists of 17 wind turbines with a total capacity of 30.6 MW. All the farms are located on the north-western edge of Poland, in Zachodniopomorskie Voivodship [16].

Iberdrola Renewables Poland Ltd. is a part of the Spanish energy group Iberdrola and has been present on the Polish renewable energy market since the year 2005. The company's activity is focused on the development of wind farm projects, their construction and maintenance activities. The company has built five wind farms with a total capacity of 184.5 MW, which is 11% of the wind energy market and ensures Iberdrola second position on the market of wind farm operators in Poland. In June 2007, Iberdrola Renewables Poland completed the construction of Kisielice wind farm with a total capacity of 40.5 MW, and in October 2008, Malbork wind farm with a total capacity of 18 MW. In 2009, two farms were started in Karścino – 90 MW and Hnatkowice-Orzechowce with a total capacity of 12 MW. The latest investment is Bystra wind farm, with a total capacity of 24 MW [17,18].

3.2. The substance of concentrations

Concentrations between undertakings can be done, basically, through mergers or acquisitions [19]. The above mentioned acquisitions of control will take place mainly by acquiring stocks,

which allows direct control over undertakings concerned. In one case, the concentration will involve the acquisition by the undertaking of a part of another undertaking's property. The Polish system for the control of concentrations is mandatory after exceeding certain turnover by the undertakings involved [20]. Moreover, it is based on a model of *ex ante* control of concentrations [21], which means that undertakings have an obligation to refrain from carrying out the transaction until its evaluation by the antitrust authority, that is the President of the Office of Competition and Consumer Protection [22].

The whole transaction encompasses the following acquisitions:

- PGE Joint-Stock Company will acquire direct control over Dong Energa Polska Ltd., Dong Energa Karnice III Ltd., Dong Energa Bukowo Ltd., Dong Energa Renewables Polska Ltd., Dong Energa Olecko Ltd.; and, indirectly, control of the three Dong Polska subsidiaries, i.e.: Kappa Sp. z o.o. Omikron Sp. z o.o. and Poland Wind Energy Sp. z o.o [13].
- Energa Hydro Ltd., a subsidiary of Energa Joint-stock company, will acquire Dong Energy Karcino Ltd., Dong Energy Pancerzyn Ltd., Dong Energy Tuszyń Ltd., Dong Energy Gąsiorowo Ltd., Dong Energy 3 [23].
- PGE Joint-Stock Company will acquire control over Iberdrola Renewables Polska Ltd. [24].
- Energa Hydro Ltd., will acquire a part of Iberdrola Renewables Ltd. Property [25].

Some of the farms are already functioning, some are in the advanced development stage but not in operation yet. The location of farms can be seen in Fig. 3.

The consent to implement a concentration is issued by way of an administrative decision by the President of the Office of Competition and Consumer Protection, which is seen in the literature as an act of supervision [26]. The consent can be given to concentrations which shall not result in significant impediments to competition in the market, in particular, by creating or strengthening a dominant position in the market [27].

In order to issue a consent to concentrate, the President had to examine if the proposed concentrations would have a negative influence on the relevant market. Therefore, the relevant product market and the relevant geographic market were appointed, in order to determine in a most accurate way the market position of the undertakings concerned [28]. The President examined the impact of the proposed transaction on horizontal, vertical and conglomerate markets (f.e. national market for the manufacture and marketing of electric power and the national market for wholesale electricity) [29]. The President found, that after concentrations the market shares of the undertakings involved would not exceed 40%, a level which could rise antitrust concern. After such assessment, on 4 June 2013 the President of the Office for Competition and Consumer Protection issued 4 decisions in which he allowed the acquisition of control over ten companies of the Dong Group and Iberdrola Renewables Polska Ltd. by PGE Polish Energy Group Ltd. and Energa Hydro Ltd. [13,23–25].

4. Offshore wind energy in Poland

Offshore wind energy is currently a subject of increasing interest of investors in Poland. It is connected with the global trend where the shift towards offshore wind project developments is observed. Offshore wind power is considered as an incipient market, especially in floating offshore [30–32]. The offshore wind energy production faces a wide spectrum of new challenges in design, development, manufacturing, installation, maintenance and operation [33]. Most research concludes that building offshore

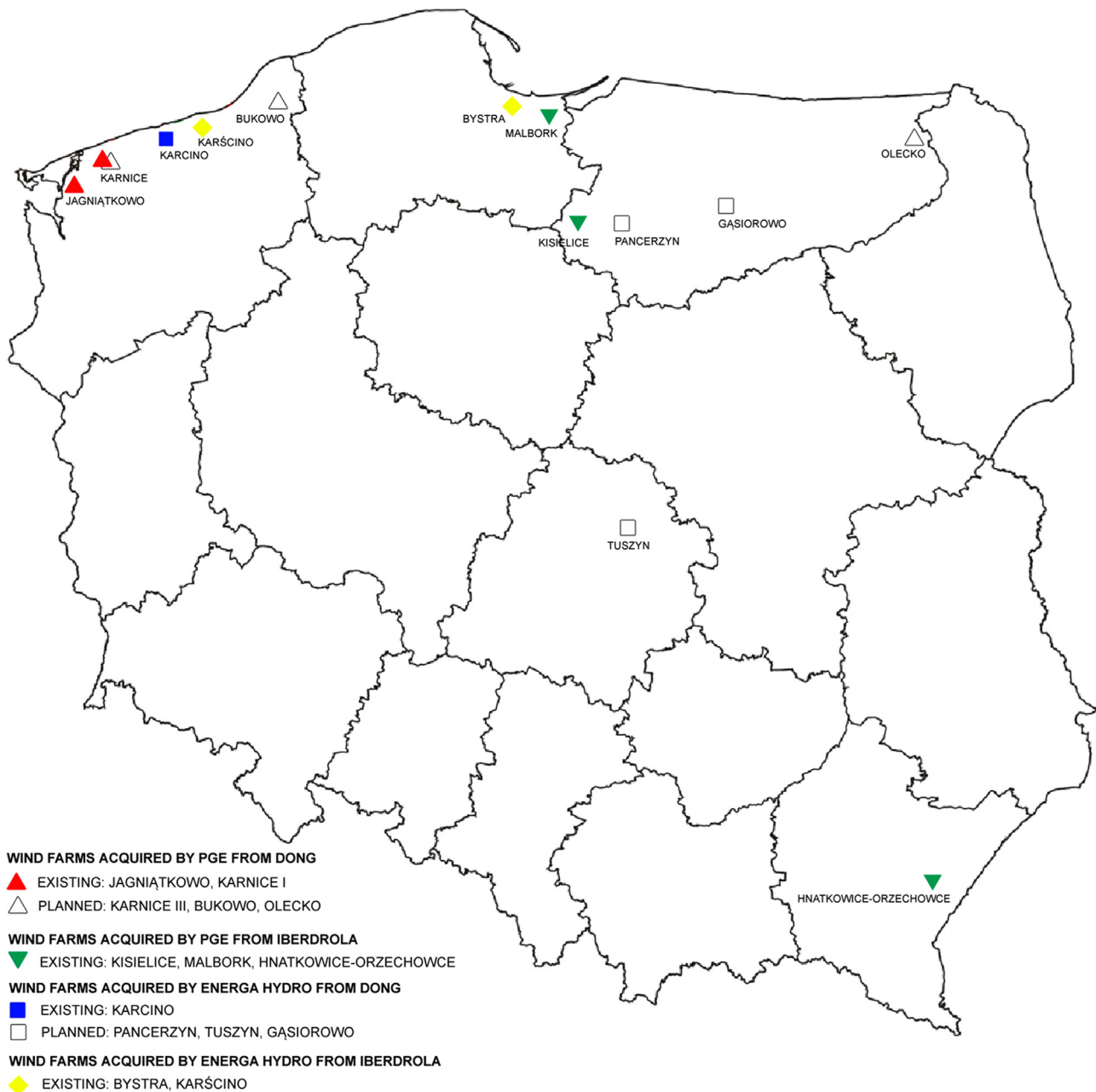


Fig. 3. Wind farms being the objects of acquisitions.

Source: own compilation based on data from [13,16–18,23–25].

wind farms is capital intensive, with long return-rate [30,31], also in comparison to onshore wind farms [32,34,35]. Moreover, the cost of floating offshore is higher than fixed offshore [36,37]. However, there are also opinions that in making such calculations the higher productivity of offshore wind farms, the stability of the production of nonbroadcast renewable energy and relatively low operating costs should strongly be taken into consideration [31,38,39]. Nevertheless, it requires governmental support for its development.

Comparative studies of onshore and offshore wind power technologies do not indicate a clear advantage of the second [30,40]. Both have significant advantages and disadvantages [30,32]. It is considered that the economic and ecological costs of offshore wind power are site specific and their ecological impacts are not directly comparable [40]. What's more the barriers and challenges of offshore wind resources are significant [31].

However, some researchers indicate that offshore wind energy has some advantages over its onshore counterpart [32].

Poland has very good natural conditions for the development of offshore wind energy. The analysis of natural conditions and possible spatial conflicts indicates that in the Polish territorial sea and exclusive economic zone the technical potential of offshore wind power is 20 GW, which due to the additional restrictions on the Natura 2000 areas should be reduced to 7.5 GW. The market potential of offshore wind energy in Poland is estimated at 1.5 GW, that represents 12% of the total market potential of wind energy, the potential possible to achieve in Poland by 2020 [3].

The first offshore wind farms projects in Poland are in the very preparatory stage. These development initiatives in offshore wind farms result from the amendment of the Act of 21 April 1991 on Maritime Zones of the Republic of Poland and the Maritime Administration that came into effect on 30 July 2011 [41].

Previously, the maritime law rules regarding the development of the so-called artificial islands imposed on the investor very high and non-refundable administration fee authorizing the conduct of investment at the early stage of the procedure. Moreover, the period of validity of such permission was very short.

The new rules of maritime law significantly changed the adverse provision. The main changes introduced by the amendment are ban on wind farm location in internal sea water and territorial seas; change of payment terms for additional fee constituting 1% of the planned development (possibility to make the fee payment in four installments); extension of the validity term of construction and exploitation permit for artificial islands from 5 to 30 years with possibility of extension for next 20 years (the permit may be declared invalid in some cases).

These legal changes have raised the interest of investors. Until June 2013, more than 60 procedures were initiated on the issue of location permits for offshore wind farms. The first location decisions and connection conditions have been issued too. However, six of the twenty-two issued decisions expired because investors did not pay the required fee. Only seven issued permits were paid. It shows that investors refrain from proceeding initiated projects [42]. Press reports also suggest that foreign investors, experienced in this field, resign from the offshore wind farms development in Poland [43].

5. Support scheme

It is obvious that RES energy cannot function at competitive costs presently [37,44]. To compensate additional costs of RES energy production governments set up various support mechanisms [45,46]. Among the existing governmental support schemes for renewable energy in the EU two main support schemes can be distinguished: feed-in tariff scheme and tradable green certificates model. Denmark, France, Germany and the Netherlands use feed-in tariffs. Poland, like e.g. Belgium [47], Italy, Sweden and the United Kingdom [48], introduced the second model.

Polish support scheme combines a mechanism of tradable green certificates (TGC) with mandatory quotas for companies generating or selling electricity and compulsory purchase of RES electricity generated by the seller [49]. Poland introduced a TGC scheme on 1 October 2005, on the basis of the amendment of the Energy Law of 10 April 1997 [50]. It requires electricity distributors to prove that certain proportion (quota) of electricity sold by them is generated from RES. The distributors prove quota fulfillment by submitting green certificates to the Energy Regulatory Office. The quota is defined by the Ministry of Economy. Green certificates are property rights arising from the conversion of issued by the President of ERO certificates of origin for electricity from renewable sources. The conversion takes place when a certificate of origin is issued for RES power generator after registration in the Origin Certificate Register. The number of generated green certificates corresponds to the amount of energy shown in the certificate (one certificate property right per 1 MWh fed into the grid). In order to fulfill the quota, energy companies choose between buying green certificates on the Polish Power Exchange (or via long-term contracts with RES generators) and paying a substitution fee. The method of calculating the amount of a substitution fee and unit substitution fee are set by the Energy Law provisions. Unit substitution fee is annually indexed.

The purpose of green certificates introduction in Poland was to ensure the lowest cost of using market mechanisms, the development of investments in renewable energy sources and the impact on the regulation and operation of renewable energy [51]. It is because the role and essence of green certificates is to introduce the competition and determine the price of the certificates in accordance with supply and demand rule [51]. As a result, the

green certificate system has a complex nature, in which renewable energy producers have to act in two related financial markets: the tradable green certificate system and the energy market [52].

According to the research comparing feed-in tariff and green certificates systems, the conclusion can be drawn that both models have their respective advantages and disadvantages [44,52]. Theoretically, a certificate scheme should be favored due to comparative advantages in terms of ecological effectiveness and economic efficiency [44]. Green certificates scheme also ensures a better promotion of RES because it is based on the market force [53]. On the other hand, compared with the green certificates system, feed-in tariffs systems show higher efficiency as evidenced by, i.e., significant growth in wind energy (large increases in power) in feed-in tariffs countries in comparison with the EU countries average [44]. The surge in the wind energy development occurred particularly in countries with feed-in tariffs such as Germany, Denmark, Spain [44,46,52,54,55]. Feed-in tariffs systems provide greater security for investors are also cheaper and easier to implement [52].

However, it should be taken into account that there is no sufficient long-term experience with the mechanism of green certificates, hence, the comparison of these two types of systems is not entirely reliable. Moreover, many countries used to shift from one model to another and gain experience with both of them. The success or failure of renewable energy support system is determined by precise, correct in detail regulations and depends on the political and economic context [39,44].

As mentioned above, in 2012 there was the highest increase in RES capacity in Poland. Consequently, the amount of energy from renewable sources (corresponding to the number of green certificates) exceeded a volume of electricity covered by the obligation of redemption by 4.1 TWh. As a result, an oversupply of certificates occurred on the market. It led to the collapse of the stock market prices of these property rights, which constitute a major part of the revenue from the installation of RES (see Fig. 4). So far, for many years, prices of green certificates have corresponded to the cost of the substitution fee. In February 2013, the stock price of green certificate fell to exceptionally low level of 100 PLN/MWh. After a few weeks the green certificates price rebounded briefly in connection with the expiry date of the cancellation of certificates for the previous year. Another short-term increase in the price of green certificates (up to about 180 PLN/MWh) occurred after announcing the intervention in the market certificates by the Ministry of Economy. In the absence of implementation of the proposed solutions, the corrective rise in prices was only a short-term phenomenon and there are no market grounds for the growth trend to come back. Oversupply of green certificates is still huge.

For each investor, it is important that the support system gives the opportunity to estimate the future cash flows with an assumed appropriate level of risk in order to determine the profitability of the investment [52]. It must be pointed out that in view of the progressing dysfunction of the support system combined with the continued absence of new legislation, the suspension of investment in the RES market including wind energy can be expected. There

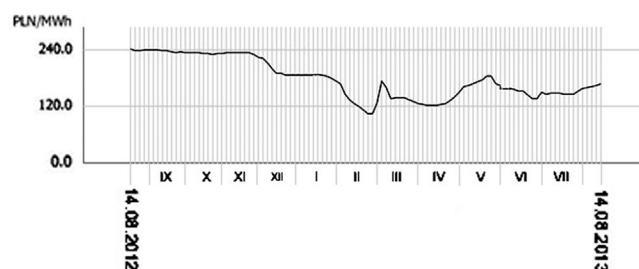


Fig. 4. Stock Exchange price of green certificates (Index PM_OZE A). Source: own compilation based on data from Polish Power Exchange.

STRENGTHS	WEAKNESSES
<ol style="list-style-type: none"> 1. Good wind conditions 2. Widespread availability and inexhaustible supplies 3. Clean, renewable energy 4. Possibility of location both on land (including fallow lands and contaminated areas) and water 5. Well-known technology 6. Very active main stakeholders – entrepreneurs. 7. Concentrations in the sector reduces costs of energy 	<ol style="list-style-type: none"> 1. Many locations covered by environmental protection areas 2. Complicated, costly and time consuming procedures to build a farm 3. Interference in the landscape 4. Environmental impact (birds, bats) 5. Can generate local societal conflicts 6. Insufficient support scheme 7. Higher costs than fossil fuels 8. Technical problems with connection to the grid 9. Lack of wind power devices manufacturing industry 10. Withdrawal of foreign investors
OPPORTUNITIES	THREATS
<ol style="list-style-type: none"> 1. Diversification of energy sources – energy safety 2. Increase in electricity demand in Poland 3. Progressive adoption of the EU standards in energy policy and regulation 4. Progress in wind energy technology 5. Increasing profitability of wind energy 6. Offshore wind energy installation 7. Microinstallations 8. New jobs 	<ol style="list-style-type: none"> 1. No long-term, stable RES policy 2. Lack of RES Act 3. Environmental obligations 4. Planned construction of a nuclear power plant 5. Unknown method of disposal at the end of product life

Fig. 5. SWOT Profile of Poland's wind energy sector.
Source: own compilation.

is a noticeable change in the perception of risk for RES investments which previously were considered to be investments with predictable and stable revenue.

6. Feasibilities for micro-installations of wind farms

Micro-installations, also wind farms, attract attention as one of the effective methods of making and consuming energy, allowing consumers to manufacture their own energy. The growth of attention is noticeable [56]. In Poland, there have also been recent amendments to Energy Law (which have not come into force yet) which regard, inter alia, micro-installations [57]. The micro-installation are regarded as a renewable energy source, with a total installed capacity of not more than 40 kW, connected to the grid of rated voltage less than 110 kV with a total thermal installed capacity of no more than 120 kW. One of the most important feasibilities for prosumers is exemption from the necessity to conduct (or start) economic activity by prosumer, which allows to avoid some extra

costs, like healthcare contribution fee for entrepreneurs. The other is that micro-installation will not require construction permit. Furthermore, in such case there will be an exemption from fee for connecting to the grid. There will be an obligation imposed on the operators of the distribution systems to buy the electricity generated by micro-installations connected to the grid and offered for sale. The purchase of this energy takes place at a price equal to 80% of the average selling price of electricity in the preceding calendar year.

According to the results of the economic analysis carried out by the Institute of Renewable Energy (IEO) it seems that the lack of the need to conduct an economic activity is not sufficient if the price of energy put into the network has been reduced by 20% and the prosumer will be deprived of the right to the green certificates [58,59].

7. SWOT analysis for wind energy sector in Poland

SWOT analysis could be a useful tool to evaluate the conditions and potential of the wind energy sector in Poland. It might help to

diagnose the present state and sketch future action line for this type of RES sector, too. SWOT analysis origins from business management and was successfully adopted by public administration in the 1980s [60,61]. SWOT analysis is performed taking into account the principles applied in the strategic planning of business organizations [62]. It has also been employed in researches in the field of energy [60,61]. In this paper, the SWOT analysis of the wind energy sector in Poland is conducted by internal/external and the present/future indicators approach [63–65]. According to this, there are two main components of SWOT: indicators of present strengths and weaknesses and indicators of future chances and threats.

The analysis is based on and includes conditions and aspects of wind energy sector in Poland described above: energy potential (Sections 2 and 4), general technical aspects (Sections 2 and 4), external environment (legal, economic and political) described in Sections 1, 2, 4–6, stakeholders (Sections 2 and 3) and presented in Fig. 5.

In each part of SWOT matrix, factors are arranged and numbered according to their decreasing importance on the basis of our analysis of their prioritization and the used sources [66–70]. However, it was not entirely possible in some cases. This analysis allows to identify actual important factors in achieving the objective, which is the development of wind energy in Poland. It leads to the conclusion that the number of present weaknesses prevails the number of strengths and the character of the former generally hinder or eliminate the latter. Moreover, it could be observed, that the key elements included in threats find their source in politics. Other aspects, like legal or technical, are of secondary importance. It leads to the conclusion that without strong political will the rapid growth of investment in wind energy sector cannot be expected.

The analysis shows that the potential of wind energy sector in Poland could be assessed as medium. This could be an important information for future investors, to pay particular attention to existing weaknesses and in future, to enlisted threats and balance them with strengths and opportunities to find pros and cons of their investments.

The integral part of the SWOT analysis is to give recommendations. Firstly, it must be observed that most of the previous SWOT analyses done for wind energy in Poland do not include this part, they confine merely to enlisting particular SWOT elements while skipping recommendations. The SWOT list could also be transformed into a series of achievable goals and recommendations which are contained among other conclusions in the following conclusions section.

8. Conclusion

The future of the wind energy market in Poland is still uncertain and not entirely clear. The analysis of the wind potential shows that the wind conditions are not a problem. The problems occur somewhere else and have economic, legal, political and social background. As regards the construction of a wind power plant, it must be said that it has a high investment capital expenditure, is relatively difficult to build because of the documents required to obtain the construction permit, and due to frequent resistance of the local community. Even though some new farms have been built recently, the number of investments is rather small comparing to the wind power potential of Poland.

The method of avoiding some of the above mentioned problems is buying the existing wind farms built by another undertaking. The purchase of the already existing and functioning wind farm resolves the problem of obtaining the construction permit and connection to the grid by the buyer. In the light of the recent

concentrations it might be expected that there might be more such transformations in the future. It is important to notice that the acquisitions were made by the two of the four largest energy companies in Poland (the other two are Enea and Tauron). This obviously leads to further consolidation of capacity, also in the wind energy sector. As a result of the concentrations, buyers will diversify their fuel mix and the potential of the buying companies in obtaining certificates of origin will rise. However, it does not change the substance of the installed capacity at the national level.

On the other hand, concentrations cannot be seen as a long-term solution for companies investing in Poland because almost all of the concentrations will be subject to scrutiny by the President of the Office of Competition and Consumer Protection, and mainly not because of the selling companies, but because of these active players on the Polish market and their current size. The concentration between these companies will not be allowed because it has already been blocked by the competition authority due to the reason that such a transaction could (and probably will) reduce competition in the energy market (production, sales and distribution of electricity) and its eventual cost would have to be paid for by the end user.

The main legal and political problems at the national level that hinder the wind energy development in Poland are lack of the Act of Renewable Energy Resources and that current political climate is not conducive to the development of wind energy but favours biomass and solar energy. A wind power plant is an investment with a long-term rate of return, therefore sustainability and predictability of law is a necessary condition for further development, which should be a priority for the governmental legislative activity.

In this context, it is difficult to assess the Polish model of green certificates. There is no doubt that the operation of the system shows that the model does not work properly. The need of modification is urgent and even transfer to the feed-in system is considered. However, such a fundamental change in the support system would probably slow down the development of wind energy due to instability of the market and the investment risk increase. Moreover, it must be taken into account that the system has been designed with the future in mind – where the price of property rights will reach the market level, being less dependent on the substitution fee.

Offshore wind energy could be a solution for the future wind energy in Poland. However, recently it can be observed that the previous enthusiasm resulting from the adoption of the amendment of maritime zone law facilitating the investment in offshore wind energy in Poland seems to weaken. The elimination of barriers is still insufficient. The main issues that cause the suspension of offshore wind energy projects seem to be the lack of new RES law with the determined level of support (especially the so-called correction factors) and the lack of dedicated solutions for connecting offshore wind farms and the management of their production.

It is also interesting to notice that Iberdrola and Dong, two of the largest developers of wind farms, are foreign companies. They have been selling their assets in Poland and one of them has resigned to build an offshore wind farm. It is too soon to say that it will be a tendency that foreign investors will cease business in Poland in favor of activities in other countries, but it is not an impossible *scenario*. The withdrawal of the foreign investors will obviously negatively influence the development of wind power energy.

Summing up, a tendency of incipient stagnation can be observed. It can be judged on the basis of the following, above mentioned, circumstances: there are relatively few new investments, the companies take over the existing farms instead of investing in new constructions, foreign investors resign and

withdraw from Poland, the enthusiasm for offshore wind energy is weakening, the final shape of the support scheme is still unknown due to protracted legislative work. The possible new direction of wind energy development could be microinstallations, but there seems to be little incentive for microinstallations in Poland too. The real stimulation of the wind energy regulation can be expected only after the creation of more favorable legal conditions for investors.

The future successful development of wind energy requires legal and financial stability and predictability. In particular, it seems that better wind energy investments in Poland require integrated actions at all stages of the investment process. Firstly, the involvement and wide informing actions for local communities with the possibility for discussions on the earliest stages of planning the new wind power developments could stop the resistance of local communities. Moreover, it should be related to maximizing local benefits from wind energy investments and transparent administrative decision-making with public participation. Additionally, the broad professional information background should be implemented to support local planning authorities, for example in the form of detailed guidance. From the commercial point of view, the wind energy is a huge chance to the local industry. Last but not most important, at the level of the central government, political will for delivery of wind developments should be mobilized. Therefore, the legal basis for a transparent system to support wind power investments should be adopted, particularly in the form of the Act of RES. The observation of the experience of other countries and the possibility to learn from these patterns and adaptation to national conditions are very valuable. Indicated in this article conditions that shape the image of wind energy in Poland should be included in the form of this integrated system as elements that interact successfully to fulfill the EU goals for Poland.

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